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EXAMINER	
DANIELSEN, NATHAN ANDREW	
ART UNIT	**PAPER NUMBER**
2627	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/612,055	CHOI, MYUNG-RYUL	
	Examiner	Art Unit	
	Nathan Danielsen	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-32 are pending.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

3. Claim 19 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 19 is objected to because it is an exact duplicate of the claim from which it depends.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 7, 12-18, 20-25, and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 12 and 23, the phrase "the turbulence above the air guide plate being unaffected by the rotating disk" renders the scope of the claim indefinite because the claim, in combination with the specification, indicate that the turbulence is generated by the rotation of the disk, as indicated by the purpose of the guide plate, which is "to separate air flow above the rotating disk into turbulence under the air guide plate and turbulence above the air guide plate" where "rotational turbulence 80 generated during rotation of the disk 60 rotates in the same direction as the rotation direction of the disk 60 between the upper surface of the disk 60 and a cover 70 of the disk drive; that is, when the disk 60 rotates

clockwise, the rotational turbulence 80 rotates clockwise as well" (page 3, ¶ 10, lines 2-5). Claims 13-18, 20-22, 25, and 25 are rejected as being dependent on a rejected base claim. Additionally, claims 7, 22, 25, and 32 recite the limitation "the air flow control unit" in line 1 of each. There is insufficient antecedent basis for this limitation in the claim. The examiner suggests changing this limitation to --the porous air flow control unit-- to correct this deficiency.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al (US Patent 6,493,310; hereinafter Kim).

Regarding claim 1, Kim discloses, with respect to figures 18, 19, and 23, a disk drive reducing noise, comprising:

a disk tray (disk tray 240) sliding in and out of the disk drive and on which a disk (disk 210) is placed;

a disk driving portion (motor 232 and turntable 234) rotating the disk at a predetermined speed;

a disk chucking apparatus (clamping member 250 and holder 252) holding the disk on the disk tray;

a data recording/reproducing unit recording data on the disk or reproducing data from the disk (optical pickup 236); and

an air guide plate (clamping member 250) installed between an upper surface of the disk tray (surface 244a) and an upper cover plate (upper part of housing 230) of the disk drive (figure 18B), parallel to the disk tray (figure 18B), and separating an air flow area (figures 19 and 23), the air flow above the disk generated by rotation of the disk being divided into turbulence under the air guide plate and turbulence above the air guide plate (figure 23).

Regarding claim 12, Kim discloses a disk drive, comprising:

a disk tray (disk tray 240) receiving a disk that is rotated, producing turbulence having a turbulence area above the rotating disk (figure 23);

an upper cover plate (upper part of housing 230) covering the disk drive; and

an air guide plate (clamping member 250) placed between the disk tray and the upper cover plate to separate air flow above the rotating disk into turbulence under the air guide plate and turbulence above the air guide plate, the turbulence above the air guide plate being unaffected by the rotating disk, and the turbulence area under the air guide plate being reduced to reduce the turbulence above the rotating disk (figure 23).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2-5, 8, 13-17, and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim, in view of Srikrishna et al (US Patent 6,882,500; hereinafter Srikrishna).

Regarding claims 2 and 13, Kim discloses everything claimed, as applied to claims 1 and 12. However, Kim fails to disclose a wedge-shaped end portion.

In the same field of endeavor, Srikrishna discloses where the air guide plate comprises an end portion having a wedge shape (end portions of fins 66 in figure 4) that is inclined in a direction in which the air flow above the disk proceeds to move the air flow above the disk up along the air guide plate (the arrows in figure 2 indicate the direction of flow of the fluid 24; therefore, the direction of fluid flow in figure 4 would be from lower left to upper right with the wedge-shaped portions, especially that of the uppermost fin, directing a larger flow into the uppermost passageway inlet than would be possible if the fins 66 did not have the wedge-shaped end portions).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the wedge-shaped end portions of Srikrishna to the front right portion of the clamping member 250 (the portion of clamping member 250 which would come in contact with the rotating air θ) of Kim as seen in figure 23A, for the purpose of aiding the transfer of heat from the fins through convection and thus to prolong the life of the drive (col. 5, lines 57-65).

Regarding claims 3 and 14, Kim discloses everything claimed, as applied to claims 2 and 13. Additionally, Kim discloses where the disk drive further comprises a first guide (outermost groove walls of predetermined clamping member 250 in figure 18B) installed on the air guide plate, perpendicular to an upper surface of the air guide plate (figure 18B), along an edge of the air guide plate (figure 18B) to rotate the air flowing up along the air guide plate in a same direction as a direction in which the disk rotates (figures 22 and 23).

Regarding claims 4 and 15, Kim discloses everything claimed, as applied to claims 3 and 14. Additionally, Kim discloses where the disk drive further comprises a second guide (any

of the groove walls of clamping member 250 except the outermost in figure 18B) installed on the air guide plate parallel to the first guide (parallel in the disk tangential direction as shown in figure 22), separated a predetermined distance from the first guide (figures 19-23), and perpendicular to the upper surface of the air guide plate (figure 18B), to divide a passing route of the air flow into two or more routes (figures 22 and 23) and rotate the air flowing up along the air guide plate in the same direction as the direction in which the disk rotates (figures 22 and 23).

Regarding claims 5 and 17, Kim discloses everything claimed, as applied to claims 4 and 15. Additionally, Kim discloses where the disk drive further comprises a guide vein (any of the groove walls of predetermined clamping member 250 in figure 18B) installed on the air guide plate to rotate the air flowing up along the air guide plate in the same direction as the direction in which the disk rotates (figures 22 and 23).

Regarding claim 8, Kim discloses everything claimed, as applied to claim 1. Additionally, Kim discloses where a through hole is formed at a central portion of the air guide plate through which the disk chucking apparatus is installed (figure 18B).

Regarding claim 16, Kim discloses everything claimed, as applied to claim 15. Additionally, Kim discloses where the disk drive comprises a plurality of second guides on the air guide plate to reduce perturbation due to a friction force (figures 19 and 22).

Regarding claim 26, Kim discloses a noise reducing apparatus for a disk drive, the disk drive having an upper cover plate (upper part of housing 230) covering the disk drive and a disk tray (disk tray 240) receiving a disk (disk 210) that is rotated, the rotating disk producing turbulence having a turbulence area above the rotating disk (figure 23), the noise reducing apparatus comprising:

an air guide plate (clamping member 250) placed between the disk tray and the upper cover plate to separate air flow above the rotating disk into turbulence under the air guide plate and turbulence above the air guide plate (figure 23), the turbulence above the air guide plate being unaffected by the rotating disk, and the turbulence area under the air guide plate being reduced to reduce the turbulence above the rotating disk thereby reducing noise of the disk drive (abstract, see also page 2, ¶ 6 of Applicant's disclosure for the relationship between noise and turbulence).

However, Kim fails to disclose a wedge-shaped end portion.

In the same field of endeavor, Srikrishna discloses where the noise reducing apparatus further comprises:

end portion having a wedge shape (end portions of fins 66 in figure 4) that is inclined in a direction in which the air flow above the disk proceeds to move the air flow above the disk up along the air guide plate (the arrows in figure 2 indicate the direction of flow of the fluid 24; therefore, the direction of fluid flow in figure 4 would be from lower left to upper right with the wedge-shaped portions, especially that of the uppermost fin, directing a larger flow into the uppermost passageway inlet than would be possible if the fins 66 did not have the wedge-shaped end portions).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the wedge-shaped end portions of Srikrishna to the front right portion of the clamping member 250 (the portion of clamping member 250 which would come in contact with the rotating air θ) of Kim as seen in figure 23A, for the purpose of aiding

the transfer of heat from the fins through convection and thus to prolong the life of the drive (col. 5, lines 57-65).

Regarding claim 27, Kim discloses everything claimed, as applied to claim 26. Additionally, Kim discloses where the disk drive further comprises a first guide (outermost groove walls of clamping member 250 in figure 18B) installed on the air guide plate along an edge of the air guide plate (figure 18B) to rotate the air flowing up along the air guide plate in a same direction as a direction in which the disk rotates (figures 12 and 13), reducing turbulence at a front edge of the disk drive ("there is provided a noise damping device for a rotating body for dampening noise due to the air flow within a housing caused by the rotation of a rotating body" (col. 2, lines 23-26)).

Regarding claim 28, Kim discloses everything claimed, as applied to claim 27. Additionally, Kim discloses where the disk drive further comprises a second guide (any of the groove walls of clamping member 250 except the outermost in figure 18B) installed on the air guide plate, parallel to the first guide (parallel in the disk tangential direction as shown in figure 22) and separated a predetermined distance from the first guide (figures 19-23), to divide a passing route of the air flow into two or more routes (figures 22 and 23) and rotate the air flowing up along the air guide plate in the same direction as the disk rotation direction (figures 22 and 23).

Regarding claim 29, Kim discloses everything claimed, as applied to claim 28. Additionally, Kim discloses where the disk drive further comprises a plurality of second guides on the air guide plate to reduce perturbation due to a friction force (figures 19 and 22).

Regarding claim 30, Kim, in view of Srikrishna, discloses everything claimed, as applied to claim 28. Additionally, Kim discloses where the disk drive further comprises a guide vein (any of the groove walls of predetermined clamping member 250 in figure 18B) installed on the air

guide plate to rotate the air flow moving up along the air guide plate in the same direction as the disk rotation direction (figures 22 and 23), reducing turbulence generated above the air guide plate where a direction of the air flow changes (abstract, see also page 2, ¶ 6 of Applicant's disclosure for the relationship between noise and turbulence).

10. Claims 6, 9-11, 18-21, 23, 24, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim, in view of Srikrishna, and further in view of Cho et al (US Patent 6,948,176; hereinafter Cho).

Regarding claims 6, 9-11, 18-21, and 31, Kim, in view of Srikrishna, discloses everything claimed, as applied to claims 4 and 15. Additionally, Kim discloses where the disk drive further comprises a porous air flow control unit to attenuate a strength and a perturbation component of the turbulence flowing above the air guide plate ("when it is intended to reduce noise due to the rotation of the disk 210 more effectively, it is possible to further install a noise absorbing member 260 within the housing 230, as shown in FIG. 23; the noise absorbing member 260 has a structure capable of absorbing noise, such as a sponge" (col. 9, lines 37-42)).
However, Kim, in view of Srikrishna, fails to discloses where the porous air flow control unit is installed on the air guide plate.

In the same field of endeavor, Cho discloses where the porous air flow control unit (sound-absorbent material 248) is installed on the air guide plate (figure 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of Kim with the sound-absorbent material of Cho, for the purpose of reducing noise in an optical disk drive (col. 6, lines 31-33).

Regarding claim 23, Kim discloses a noise reducing apparatus for a disk drive, the disk drive having an upper cover plate (upper part of housing 230) covering the disk drive and a disk tray (disk tray 240) receiving a disk (disk 210) that is rotated, the rotating disk producing

turbulence having a turbulence area above the rotating disk (figure 23), the noise reducing apparatus comprising:

an air guide plate (clamping member 250) placed between the disk tray and the upper cover plate to separate air flow above the rotating disk into turbulence under the air guide plate and turbulence above the air guide plate, the turbulence above the air guide plate being unaffected by the rotating disk, and the turbulence area under the air guide plate being reduced to reduce the turbulence above the rotating disk thereby reducing noise of the disk drive;

a first guide (outermost groove walls of predetermined clamping member 250 in figure 18B) installed on the air guide plate along an edge of the air guide plate (figure 18B) to rotate the air flowing up along the air guide plate in a same direction as a direction in which the disk rotates (figures 22 and 23), reducing turbulence at a front edge of the disk drive (abstract, see also page 2, ¶ 6 of Applicant's disclosure for the relationship between noise and turbulence);

a second guide (any of the groove walls of clamping member 250 except the outermost in figure 18B) installed on the air guide plate, parallel to the first guide (parallel in the disk tangential direction as shown in figure 22) and separated a predetermined distance from the first guide (figures 19-23), to divide a passing route of the air flow into two or more routes (figures 22 and 23) and rotate the air flowing up along the air guide plate in the same direction as the disk rotation direction (figures 22 and 23);

a guide vein (any of the groove walls of predetermined clamping member 250 in figure 18B) installed on the air guide plate to rotate the air flow moving up along the air guide plate in the same direction as the disk rotation direction, reducing

turbulence generated above the air guide plate where a direction of the air flow changes (abstract, see also page 2, ¶ 6 of Applicant's disclosure for the relationship between noise and turbulence); and

a porous air flow control unit to attenuate a strength and a perturbation component of the turbulence flowing above the air guide plate (col. 9, lines 37-42 as cited in claims 6, 9-11, and 18-21).

However, Kim fails to disclose a wedge-shaped end portion and where the porous air flow control unit is installed on the air guide plate.

In the same field of endeavor, Srikrishna discloses where the noise reducing apparatus further comprises:

end portion having a wedge shape (end portions of fins 66 in figure 4) that is inclined in a direction in which the air flow above the disk proceeds to move the air flow above the disk up along the air guide plate (the arrows in figure 2 indicate the direction of flow of the fluid 24; therefore, the direction of fluid flow in figure 4 would be from lower left to upper right with the wedge-shaped portions, especially that of the uppermost fin, directing a larger flow into the uppermost passageway inlet than would be possible if the fins 66 did not have the wedge-shaped end portions), reducing a perturbation portion of the turbulence above the air guide plate (inherent in wedge-shaped structures when compared to flat-ended structures).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the wedge-shaped end portions of Srikrishna to the front right portion of the clamping member 250 (the portion of clamping member 250 which would come in contact with the rotating air θ) of Kim as seen in figure 23A, for the purpose of aiding

the transfer of heat from the fins through convection and thus to prolong the life of the drive (col. 5, lines 57-65).

In the same field of endeavor, Cho discloses where the porous air flow control unit (sound-absorbent material 248) is installed on the air guide plate (figure 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of Kim with the sound-absorbent material of Cho, for the purpose of reducing noise in an optical disk drive (col. 6, lines 31-33).

Regarding claim 24, Kim, in view of Srikrishna and Cho, discloses everything claimed, as applied to claim 23. Additionally, Kim discloses where the disk drive comprises a plurality of second guides on the air guide plate to reduce perturbation due to a friction force (figures 19 and 22).

11. Claims 7, 22, 25, and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Kim, in view of Srikrishna and Cho, and further in view of Balrow et al ("Low-Speed Wind Tunnel Testing" as cited on Applicant's form PTO-1449 dated 03 July 2003; hereinafter Balrow).

Regarding claims 7, 22, 25, and 32, Kim, in view of Srikrishna and Cho, discloses everything claimed, as applied to claims 6, 18, 23, and 31. However, Kim, in view of Srikrishna and Cho, fails to disclose the structure of the porous air flow control unit as well as the structure.

In the same field of endeavor, Balrow discloses where the air flow control unit comprises a mesh screen installed on the air guide plate having a screen structure to attenuate turbulence flowing above the air guide plate in an axial direction and a honeycomb structure to attenuate turbulence in a lateral direction, the mesh screen reducing noise and turbulence by changing an anisotropic strong turbulence to an isotropic weak turbulence ("turbulence in the test section is reduced by the installation of honeycombs and screens; screens reduce the axial turbulence

more than the lateral turbulence; honeycombs ... reduce lateral velocities" (page 74, section 2.11, lines 1-6 and page 75, line 1)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the abovementioned structure of Balrow in the porous air flow control unit of Cho in the structure of Kim, for the purpose of reducing turbulence while minimizing overall power loss in the system (page 75, lines 5-6).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Danielsen whose telephone number is (571) 272-4248. The examiner can normally be reached on Monday-Friday, 8:30 AM - 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A.L. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nathan Danielsen ND
04/12/2006

Andrea Wellington
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